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ABSTRACT

As part of an exploration of how best to use normal personality measures in career development and guidance, this study investigated the use of the Sixteen Personality Factor Questionnaire Fifth Edition (16PF Fifth Edition) assessment and its relationship to the widely used typology of J. L. Holland (1985) and the new Campbell Orientations (1992). The 16PF Fifth Edition is a normal personality assessment used in clinical, counseling, and industrial/organizational settings. It provides scores on 16 primary factors or scales and 5 global factors or scales. A sample of 1,770 examinees was obtained from the 16PF Fifth Edition standardization sample, with selection based on college major or chosen occupation. Each of these majors and occupations was coded for Holland type and Campbell Orientation. The sample was divided into two groups, one for Campbell and one for Holland, to cross validate the discriminant functions and resultant hit rates. Profiles were developed for Holland types and Campbell orientations and for the majors and occupations. Results indicate that general personality measurement adds a new dimension to career development and guidance, and provides some insights into the individual's expected behaviors in a variety of settings. (Contains 3 figures, 4 tables, and 10 references.) (SLD)

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ED 399 288

The Global Factors of the *16PF Fifth Edition*: Contribution to Career Development and Guidance

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Much work has been done in the study of normal personality by psychologists such as Cattell, Eber, and Tatsuoka (1970), Myers and McCaulley (1985), and Costa and McCrae (1992) to name just a few. The idea of a small set of generally accepted personality structures emerged in the personality literature in the 1960s and has gained acceptance over the years as the big five model of personality. Today there are several instruments that provide scores for this model of personality. However, the use of normal personality assessment has not been a focal point of the career development process. Instead, the focus of the career development process has been on the individual's abilities, skills, and career related interests. For over 20 years Walter (1995) has provided career development suggestions in his work as a consulting psychologist using the 16PF. McCaulley working with the MBTI has put together occupational type libraries for the Myers-Briggs Type Indicator (MBTI) over the past 20 years of MBTI usage. However, little else has been done with integrating normal personality measures into the career guidance process.

It may be time for normal personality assessment to make a contribution to the career development of individuals. The workplace is changing and the demands placed on individuals seem to exceed the current focus of career development. More emphasis is now being placed on constructs such as conscientiousness and integrity. These constructs, which are aspects of normal personality, are not currently assessed in the career guidance process. Employers, when surveyed, tend to list willingness to learn, good work ethics, conscientiousness, and reliability as characteristics for new hires. These are clearly not abilities, vocational interests, or work preferences, but rather constructs that are rooted in personality dimensions. It is true that some of these constructs could be taught or trained while others may be more innate. In either case, these constructs play an important part in the changing nature of work in America.

This study investigates one assessment, the 16PF Fifth Edition and its relationship to the widely used Holland Typology (1985) and the new Campbell Orientations (1992). This is the first of several studies planned to determine how best to use normal personality measures in career development and guidance. The studies will focus on the 16PF Fifth Edition global factors. These global factors are closely aligned to the big five personality dimensions that appear in the arena of personality psychology.

Method

Instrument

The 16PF Fifth Edition is a normal personality assessment used in clinical, counseling, and industrial/organizational settings. The assessment provides scores on 16 primary factors or scales and five global factors or scales. The 16PF contains 185 items, all but 15 of these are answered in an endorse, not endorse, or unsure format. The last 15 items are the Reasoning (B) factor items which have correct answers and constitute a three option multiple-choice item format. The sixteen primary factors have internal consistencies ranging from .70 to .86. These are vast improvements over the earlier editions of the 16PF. The five global factors are not scales measured by items but are obtained by factor analyzing the 16 primary factor loadings to further reduce the number of factors. This second order factor analysis produces five robust factors that have been used as terms for the 16PF Fifth Edition global factors.

For this study, only the global factors were used. These five global factors correspond closely to the big five model of personality. Those individuals familiar with the 16PF will recall that in earlier documents for the 16PF these were called second order factors. The five global factors include: Extraversion, Anxiety, Tough-Mindedness, Independence, and Self-Control. For a complete description of the 16PF Fifth Edition see Russell and Karol (1994) and Conn and Rieke (1994). The Extraversion scale measures how socially inhibited or socially participating an individual may be generally. The Anxiety scale measures the person's tendency to be tense and perturbable. The Tough-Mindedness scale measures the individual's open-mindedness and receptiveness. The Independence scale measures the person's agreeableness and independent nature. The Self-Control scale measures the individual's self-restraint versus the tendency to follow one's urges. Table 1 provide a verbal description of high and low scores on these five global factors as well as a reference to the primary factors that make up each global factor.

Sample

A sample of 1,770 examines was obtained from the standardization sample of the 16PF Fifth Edition. Examinees were selected based on the college major or the chosen occupation he or she reported at the time of testing. Only majors and occupations containing 30 or more individuals were retained in this study. Each of these majors and occupations was coded for Holland type (e.g., teacher was coded S for Social) and for Campbell Orientation (e.g., Law Enforcement was coded A for Adventuring). Therefore, the record for each of the 1,770 examines contained the persons major or occupation, a code for Holland type, a code for Campbell orientation, and the five scores for the 16PF Fifth Edition global factors. The scores for the five global factors are reported in a standard score form with a mean of 5.5 and a standard deviation of 2. This scale is known as the standard ten or sten score.

Analyses

Two different approaches were used to describe the usefulness of the big five personality model as measured by the 16PF Fifth Edition. The first approach utilized the discriminant analysis (DA) methodology (all of the discriminant analyses were carried out using SPSS PC+). Since the grouping variable must be an integer the Holland types were assigned as follows: Realistic (R) = 1, Investigative (I) = 2, Artistic (A) = 3, Social (S) = 4, Enterprising (E) = 5, and Conventional (C) = 6. The Campbell Orientations were assigned as follows Producing (P) = 1, Adventuring (A) = 2, aNalyzing (N) = 3, Creating (C) = 4, Helping (H) = 5, Influencing (I) = 6, and Organizing (O) = 7. The second approach was descriptive, using the mean and standard deviations for various groups of examinees.

Results

During the discriminant analysis, the sample of 1,770 examinees was divided randomly into two groups (i.e., 2/3 and 1/3) to cross-validate the discriminant functions and resultant hit rates. Two discriminant analyses were completed, one for Holland types and one for Campbell Orientations.

The first analysis used the Holland type as the grouping variable. The chance hit rate for classification into the six Holland categories is 16.7 percent. The five global factor scores were used as the predictor variables. Table 2 provides the hit rate for the classification group. The overall hit rate from the five global factors was 60 percent. All group classifications were well above the 16.7 percent chance hit rate. The cross-validated overall hit rate was 56 percent. A plot of the group centroids on the first two discriminant functions produced a misshapen hexagon with the RIASEC pattern. This is not an unexpected result as the shape of the Holland hexagon has been discussed many times in the career development literature (Prediger & Vansickle, 1991).

The second analysis used the Campbell Orientations as grouping variables. Table 3 contains the classification group hit rates. The chance hit rate for seven categories is 14.2 percent. In all cases the classification rate was better than chance, with overall classification of 54 percent and a cross-validated hit rate of 48 percent.

The results of the DA were encouraging as the hit rates were above chance and the cross-validated hit rates were similar to the classification group's hit rates. Therefore, a second set of descriptive analyses were completed. These analyses produced profiles of the five global factors for various groups of examinees. The profiles provide an indication of how various groups of individuals might score on the five global factors. First, the Holland types and Campbell Orientations were used as grouping variables and means and standard deviations were computed. The means for each grouping variable were then plotted. Figure 1 contains the mean profiles for the Holland types across all 1,770 examines. Figure 2 provides the same information but uses the Campbell orientations as grouping variables. The variations in the profiles make sense. For example, Social types tend to be high on the Extraversion scale while Realistic and Investigative types tend to be lower on the Extraversion scale.

In addition to profiles by Holland type and Campbell Orientation, profiles for the majors and occupations were developed. Figure 3 contains the profiles for a few of the majors and occupations in the sample. Again, the profiles vary by occupation or major and appear to make good sense. Table 4 contains the means and standard deviations of the five global factors for all of the majors and occupations in this study.

Discussion

Although based on a sample of convenience, the results of this study indicate that general personality measurement adds a new dimension to career development and guidance. Instead of focusing solely on the work-related interests, a counselor would find additional information to aid the guidance process by using a measure of normal personality that reports scores for the big five personality model. Certainly, there is overlap between measures of work personality and measures of normal personality. However, the latter provides some new insights into the individual's expected behaviors in a variety of settings. A counselor would have an indication of the person's general behaviors toward working with people, amount of independence, and amount of self-control to mention just a few of the additional areas or dimensions measured in normal personality assessments. In addition, the measures of normal personality are not as prone to demand characteristics as are work-related measures.

Again, this is the first in a series of studies of this type. Future studies will target a wider range of occupations and majors and will acquire scores for Holland types and Campbell Orientations. The ultimate goal of this research is to develop a comprehensive measure that will address the needs of the career guidance professional.

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Table 1

The *16PF Fifth Edition* Global and Related Primary Factors

Left Meaning	Global/Primary Factor	Right Meaning
Introverted, Socially Inhibited	**Extraversion (EX)**	Extraverted, Socially Participating
Reserved, Impersonal, Distant	**Warmth (A+)**	Warm, Outgoing, Attentive to Others
Serious, Restrained, Careful	**Liveliness (F+)**	Lively, Animated, Spontaneous
Shy, Threat–Sensitive, Timid	**Social Boldness (H+)**	Socially Bold, Venturesome, Thick–Skinned
Forthright, Genuine, Artless	**Privateness (N-)**	Private, Discreet, Non–Disclosing
Group–Oriented, Affilative	**Self-Reliance (Q2-)**	Self–Reliant, Solitary, Individualistic
Low Anxiety, Unperturbed	**Anxiety (AX)**	High Anxiety, Perturbable
Reactive, Emotionally Changeable	**Emotional Stability (C-)**	Emotionally Stable, Adaptive, Mature
Trusting, Unsuspecting, Accepting	**Vigilance (L+)**	Vigilant, Suspicious, Skeptical, Wary
Self–Assured, Unworried, Complacent	**Apprehension (O+)**	Apprehensive, Self–Doubting, Worried
Relaxed, Placid, Patient	**Tension (Q4+)**	Tense, High Energy, Impatient, Driven
Receptive, Open–Minded, Intuitive	**Tough–Mindedness (TM)**	Tough–Minded, Resolute, Unempathetic
Reserved, Impersonal, Distant	**Warmth (A-)**	Warm, Outgoing, Attentive to Others
Utilitarian, Objective, Unsentimental	**Sensitivity (I-)**	Sensitive, Aesthetic, Sentimental
Grounded, Practical, Solution–Oriented	**Abstractedness (M-)**	Abstracted, Imaginative, Idea–oriented
Traditional, Attached to Familiar	**Openness to Change (Q1-)**	Open to Change, Experimenting

(Table Continues)

Table 1 (continued)

Left Meaning	Global/Primary Factor	Right Meaning
Accommodating, Agreeable, Selfless	**Independence (IN)**	Independent, Persuasive, Willful
Deferential, Cooperative, Avoids Conflict	**Dominance (E+)**	Dominant, Forceful, Assertive
Shy, Threat–Sensitive, Timid	**Social Boldness (H+)**	Socially Bold, Venturesome, Thick–Skinned
Trusting, Unsuspecting, Accepting	**Vigilance (L+)**	Vigilant, Suspicious, Skeptical, Wary
Traditional, Attached to Familiar	**Openness to Change (Q1+)**	Open to Change, Experimenting
Unrestrained, Follows Urges	**Self–Control (SC)**	Self–Controlled, Inhibits Urges
Serious, Restrained, Careful	**Liveliness (F-)**	Lively, Animated, Spontaneous
Expedient, Nonconforming	**Rule–Consciousness (G+)**	Rule–Conscious, Dutiful
Grounded, Practical, Solution–Oriented	**Abstractedness (M-)**	Abstracted, Imaginative, Idea–oriented
Tolerates Disorder, Unexacting, Flexible	**Perfectionism (Q3+)**	Perfectionistic, Organized, Self–Disciplined

Left Meaning	Primary Factor	Right Meaning
Concrete	**Reasoning (B)**	Abstract

Note: The "+" and "-" signs indicate the relationship of the Primary Factor to the Global Factor. For example, factor Liveliness (F) is inversely related to Self–Control (SC). That is, high scores on Factor Liveliness (F) lowers the individual's Self–Control score (SC).

Primary Factor Reasoning (B) does not contribute to any single Global Factor and is presented at the end of the table for completeness and understanding of the *16PF Fifth Edition* structure.

Table 2

Hit rate for Holland's types using the five global factor scores from *16PF Fifth Edition*

		Predicted Group Membership					
Actual Group	n	R	I	A	S	E	C
R	175	**94**	40	4	1	23	13
		53.7	22.9	2.3	.6	13.1	7.4
I	228	38	**92**	27	18	30	23
		16.7	**40.4**	11.8	7.9	13.2	10.1
A	281	1	33	**186**	45	15	1
		.4	11.7	**66.2**	16.0	5.3	.4
S	240	0	9	26	**177**	10	18
		.0	3.8	10.8	**73.8**	4.2	7.5
E	131	13	7	8	5	**91**	7
		9.9	5.3	6.1	3.8	**69.5**	5.3
C	241	33	21	0	25	16	**146**
		13.7	8.7	.0	10.4	6.6	**60.6**

Table 3

Hit rate for Campbell's Orientations using the five global factor scores from *16PF Fifth Edition*

Actual Group	n	Predicted Group Membership						
		P	A	N	C	H	I	O
P	172	**80**	15	36	10	0	10	21
		46.5	8.7	20.9	5.8	.0	5.8	12.2
A	125	4	**68**	14	1	5	13	20
		3.2	**54.4**	11.2	.8	4.0	10.4	16.0
N	165	29	22	**66**	23	5	5	15
		17.6	13.3	**40.0**	13.9	3.0	3.0	9.1
C	252	13	4	20	**130**	56	26	3
		5.2	1.6	7.9	**51.6**	22.2	10.3	1.2
H	260	4	8	3	47	**163**	23	12
		1.5	3.1	1.2	18.1	**62.7**	8.8	4.6
I	146	7	8	3	10	17	**98**	3
		4.8	5.5	2.1	6.8	11.6	**67.1**	2.1
O	176	28	30	7	0	10	3	**98**
		15.9	17.0	4.0	.0	5.7	1.7	**55.7**

Table 4

Means and Standard Deviations for the Five Global Personality Factors for Majors and Occupations (n = 1,770)

		Extraversion		Anxiety		Tough–Minded		Independence		Self–Control	
	n	Mean	SD	Mean	SD	Mean	SD	Mean	SD	Mean	SD
Biology	37	5.85	1.80	6.14	1.55	4.90	1.90	5.14	2.04	4.70	1.56
Business Administration	88	5.66	1.85	5.45	1.97	5.94	1.74	5.68	1.84	5.30	1.68
Counseling/Clinical Psyc	80	6.62	1.81	4.50	2.35	4.41	1.97	5.84	1.83	5.18	1.75
Elementary Education	49	5.76	1.97	5.63	2.10	5.17	1.67	5.24	1.96	5.81	1.74
Farming	45	4.85	2.04	5.37	2.64	6.98	1.46	5.11	2.02	6.25	1.53
Foremen/Supervisors	96	5.32	1.89	4.69	2.11	6.12	2.01	5.88	1.94	5.95	1.81
Psychology	284	6.14	1.94	5.74	2.11	4.40	1.77	5.78	1.97	4.89	1.71
Sale Merchandise	63	5.69	2.00	5.19	1.93	5.74	1.89	5.95	2.14	5.45	1.68
Secretarial	98	5.85	1.96	4.56	2.11	5.76	2.11	6.04	1.82	6.04	1.62
Social Work	51	6.24	1.74	5.86	1.88	3.80	1.47	5.65	1.91	4.23	1.34
Architecture & Engineering	44	5.32	2.32	5.71	2.52	5.94	1.54	5.65	2.11	5.52	1.93
Bookkeeping	87	5.61	1.79	5.60	2.11	4.87	1.61	4.93	1.78	6.09	1.80
Criminal Justice/Law Enforcement	34	5.94	1.75	4.63	2.22	6.35	1.85	6.36	1.51	6.14	1.92
Education	34	6.26	2.00	5.20	2.21	4.79	1.90	5.31	1.97	5.28	1.66
Engineering	50	5.13	1.95	5.88	2.46	6.30	1.84	5.24	1.60	4.83	1.38
Information Distribution	31	5.05	1.68	5.72	2.46	6.19	1.55	4.76	2.27	6.07	1.32
Lodging Services	51	5.88	1.81	6.56	2.44	5.17	1.78	5.66	1.80	4.83	1.82
Printing Occupations	35	4.48	2.09	6.10	2.65	6.54	1.86	5.32	2.25	5.45	1.93
Banking Administration	72	5.89	1.73	5.85	2.11	4.54	1.75	6.03	1.82	5.44	1.71
Building Services	110	5.52	2.11	4.46	2.42	6.29	1.92	6.01	1.91	6.22	1.61
Domestic Service	52	5.80	1.76	5.31	1.98	5.50	2.19	5.81	1.79	5.36	1.77
Food & Beverage Service	31	4.99	2.01	6.59	2.54	5.10	1.53	4.84	1.62	5.60	1.57
Human Resources	46	6.29	1.66	5.05	1.82	5.51	1.91	5.66	1.78	5.38	1.94
Leatherwork	68	5.01	1.64	5.31	2.48	6.45	1.96	5.72	2.08	5.40	1.76
Nursing	96	6.65	1.58	5.91	1.98	4.85	1.78	5.40	1.81	5.08	1.44
Upper Level Management	38	6.33	1.74	5.29	1.96	5.46	1.89	5.70	1.89	5.39	1.52

Figure 1.
Mean Profiles for the Five Global Factors of the *16PF Fifth Edition* by Holland Type.

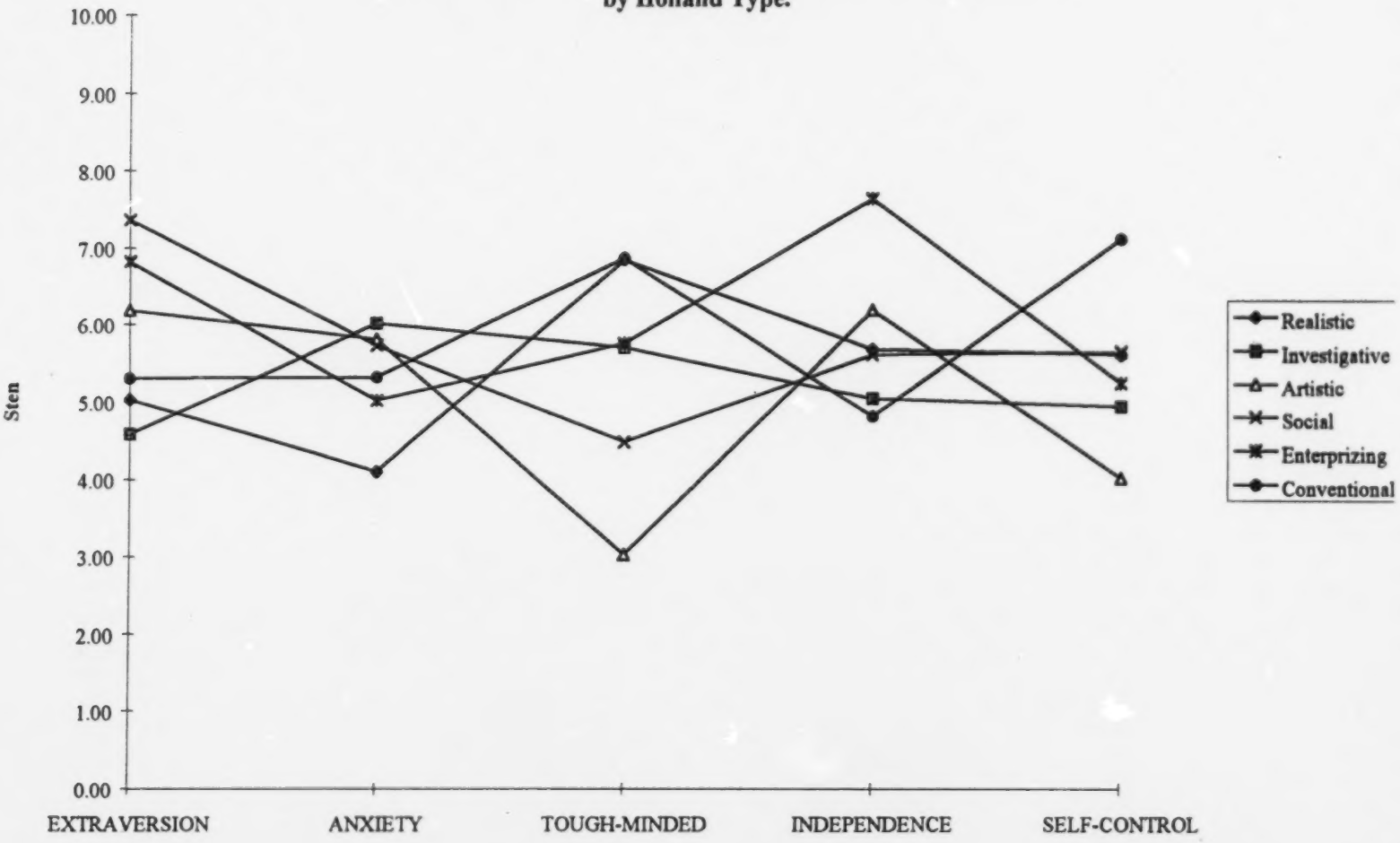

Figure 2.
Mean Profiles for the Five Global Factors of the 16PF Fifth Edition by Campbell Orientation.

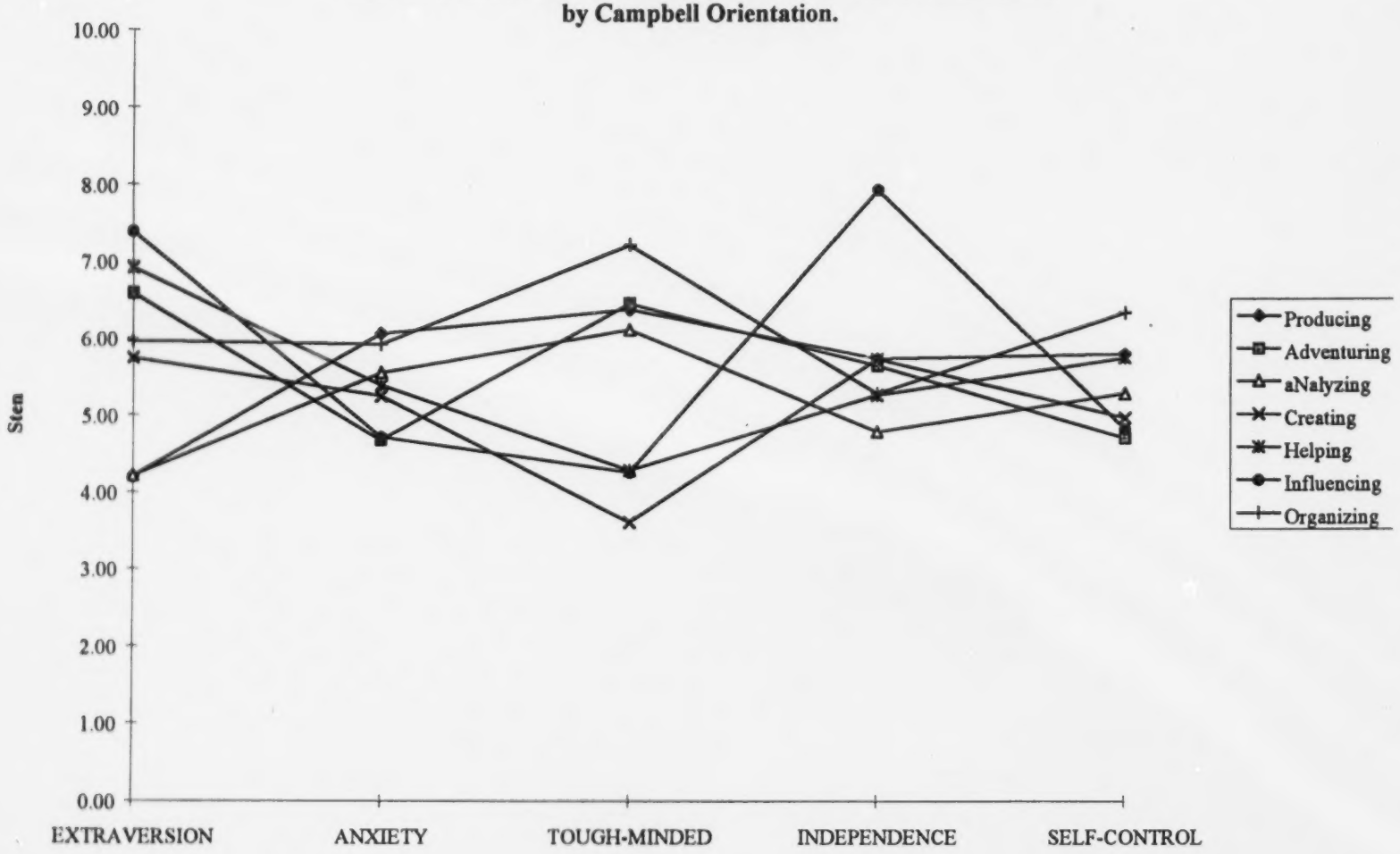

Figure 3.
Mean Profiles for the Five Global Factors of the 16PF Fifth Edition by Major or Occupation.